Attachment A

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EXPERIMENTAL RESEARCH FACILITY
FOR USE BY
THE INTELLIGENCE COMMUNITY

WORKING PAPER

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Approved For Release 2004/10/27 : CIA-RDP79M00096A000500060003-0

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WORKING PAPER

Experimental Research Facility
For Use by the Intelligence Community

I. Introduction

An experimental research facility will be established for use by the intelligence community in response to the need expressed by the PFIAB for improved intelligence information handling. This facility will place a new and increased emphasis on experimental development, testing, and evaluation of information handling. This increased emphasis will be accomplished through cooperation in the intelligence community, with the centers of excellence located in the intelligence agencies/departments. These centers of excellence will use this experimental research facility for improved information handling in the intelligence community on a long range basis.

Some of the attributes of this facility are to provide (1) for building, testing, and evaluating a next generation information system, (2) for a cooperative effort in intelligence information handling, (3) an improved information handling system for operational use, and (4) "prototyping" the improved information handling system as an experimental research facility. The solution environment will use readily available hardware and software, wherever possible, to provide an operational solution for handling of substantive intelligence on the basis of using an integrated intelligence data base.

II. Concept of Experimental Development

This experimental research facility will consist of an experimental computer-communications network for use in the intelligence community in the Washington, D. C. area. This facility and related contractual support will be funded by ARPA during the experimental design, development, testing and evaluation until the facility becomes fully operational for productional type of use. When the facility has become operational for productional use, the computer-communications equipment will be transferred to the member agencies/departments of the intelligence community and the system coordination will be transferred to the DCI.

The computer-communications system will be developed with three computer complexes. The major computer complexes will be located at CIA, DIA, and NSA, and will be identical to the extent that the same software can be used at any of the computer complexes. The system and its data base will be developed during the experimental phase with participation by the total intelligence community. The developmental atmosphere will be similar to Project MAC. The equipment will be funded by ARPA with cooperative participation in the experimental development and use of the system and its data bases by employees of the intelligence community. For example, a typical participating intelligence employee may be working at CIA, DIA, or NSA, and

be devoting part-time in a joint appointment to this project. (This is similar to a joint appointment of a professor to the Department of Mathematics and the Department of Computer Science.) The end-product of this cooperation and participation would be a computer-communication network system designed and built with participation of the intelligence community employees for operational use by the intelligence community on a continuing basis.

The work environment associated with this experimental research facility will be that of a strengthened committment to in-house developmental efforts on a cooperative intelligence basis. ARPA will provide funding for some initial studies, rental/purchasing of the computer-communications hardware and software, and 40% of the cost of building large community data bases. The individual agencies/departments will participate in the various studies/committees, provide all personnel for operation and management of this facility, and pay for 60% of the cost of building large community data bases.

III. Technical Approach

Each agency (DIA, CIA, and NSA) will provide 30 fulltime persons for experimentation, research and development, management, and operation of these facilities; and an unspecified number of persons in the use of these experimental facilities. Each agency will cooperate in providing the substantive intelligence

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for construction of the data base, assist in design and development of the computer-communications system, and participate in the continued cooperative operation of this facility for long term use by the intelligence community.

The experimental research facility and its program will be managed by the Director, ARPA. The management structure for this facility is shown in the attached chart. An ARPA project office will be established with two persons (one from DOD and CIA each) for this purpose. A Board of Directors, comprised of one person from each NSA, DIA, and CIA will provide advice and guidance to the Director, ARPA. The full-time daily management of the computer-communications facilities will be performed by the current COINS Manager and his staff. The full-time daily management of the experimental intelligence services will be the responsibility of the Project Office. When this facility becomes fully operational, the coordination of the operation of the system will be performed by the DCI.

The communications for this facility will be the communication services that will be available as described [redacted] 25X1

The COINS Experiment will be kept operational and provide continued service to the user/analyst until an equivalent or better service is available.

The technical problems to be addressed in this experimental research facility consists of improved intelligence information handling in a distributed data base in a distributed computer-communicati[redacted] addressed

is the application of improved information handling techniques to intelligence information handling. Experimental efforts will be devoted to large file handling; multi-source inputting from many collectors; structuring of large files for quick input, updating, and retrieval; correlation of output information from multiple files; interactive graphical techniques for use with large data bases; and other similar techniques in support of enhanced use by the intelligence user/analyst.

The substantive intelligence to be included in this system consist of (1) the information contained in the files in the COINS Experiment, (2) all-source intelligence related to the Communist offensive and defensive missiles, (3) all-source intelligence relating to the military capabilities of the Soviet and Bloc countries, and (4) all-source intelligence related to the Middle East crisis. The operational problems to be addressed are those problems in making the above-listed intelligence available to potential end-product users in as nearly real time as possible in this resource sharing network. The emphasis will be placed on user involvement to enhance the user acceptance of the operational end-product intelligence. The priorities to be assigned to the last three areas of substantive intelligence mentioned above will be determined after problem definition and analysis to be performed with the support of a contractor. This problem definition and analysis period will ~~will~~ last for three months and will use

two contract persons with the appropriate security clearances needed to visit the desired portions of the intelligence community. The problem definition and analysis study will be performed in early FY71.

IV. Implementation Plan

Phase 0

The experimental research facility will be designed using the benefits of the considerable experience obtained from the COINS Experiment, and the experience obtained from the IHC/USIB and its support staff.

The system studies being performed in the COINS Experiment will be completed in FY71 and will provide valuable input to the design of this facility. The system studies are being performed in:

1. User languages and data base management systems
2. Remote terminals and character set
3. Communications configuration
4. Software security
5. Security labels
6. Computers and communications interface

The existing efforts throughout the community in examining and determining what information and information handling services are needed by the potential users will be a valuable input to the design and development of this facility. The existing efforts in building further data bases will provide further

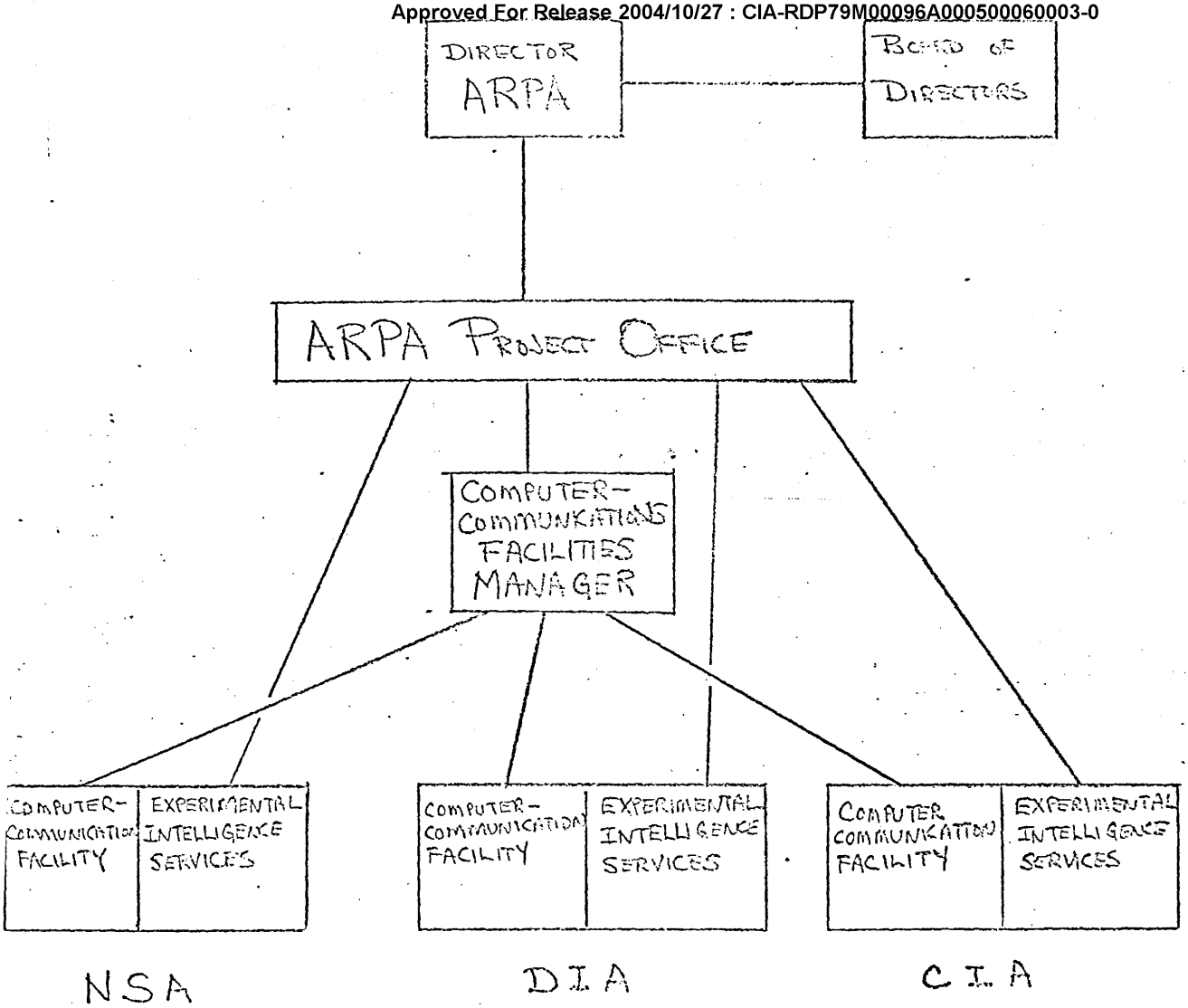
guidance for continued data base and file building in the experimental research facility.

A high priority in the early phases of this effort will be to obtain an operational capability on readily available hardware from the manufacturer. Therefore it will be necessary to rent the hardware equipments, initially, with the option to purchase. The hardware will be purchased in the latter phases of this project, as funding becomes available.

Phase I

In phase I (FY71), funding will be provided to perform studies on (1) operating and executive systems, including scheduling algorithms and priority systems, and (2) the configuration of the computer-communications system for the experimental research facility. These two studies will be funded by ARPA. The results of the six on-going COINS system studies will be a valuable input to these two studies. The intelligence community will participate in these studies, and provide continued input to assure that the experimental research facility will fulfill their long range needs in information handling.

A contractor-assisted study will be performed in early FY71 on problem definition and analysis, to assist in assessment of priorities in the construction of the three new data bases, not in the COINS Experiment. This study will require assistance



PROJECT MANAGEMENT STRUCTURE

from two contractual persons for a duration of three months, in addition to the cooperation of the intelligence community.

Before the end of phase I, specifications for the system hardware and software will be published. These specifications will be based on the experience from the COINS Experiment, the results of the three months study, and recommended specifications as submitted for this facility by the Director, CIA, Director, DIA, and Director, NSA.

Funding for phase I (FY71) by ARPA will be [redacted], with all funds not devoted to the study efforts, used to obtain some initial facilities or software. 25X1

Phase II

Phase II will be accomplished in FY72 and will consist of:

1. Design(as required at a minimum) and installation of the supervisory and operating systems, and applications software. This will be a joint effort of the intelligence community and a contractual effort, which is expected to continue into other phases.
2. Installation of the initial hardware complex.
3. Establishment of an initial operational capability on the experimental research facility.
4. Begin efforts on transfer of data bases to this facility, and construction of further data bases on this facility.

ARPA will provide six million dollars for facilities and contracts during phase II. Each agency (DIA, CIA, and NSA) will provide a dedicated staff of 30 persons, an unspecified number of part-time cooperative staff, and 60% of cost of data base construction. The dedicated staff will include 10 intelligence function specialists and 20 persons to serve as managers, computer operators, computer scientists, and information scientists.

Phase III

Phase III will be accomplished in FY73 and FY74 and will consist of:

1. Continued efforts in building of data bases.
2. Experimentation in improved information handling techniques.
3. Addition of further hardware, software, and communications equipment to accommodate the increased workload and to provide for system improvements.
4. Continual evaluation, improvement, and upgrading of this facility for enhancement of user/analyst acceptance.

25X1 ARPA will provide [redacted] for facilities and contracts in the above efforts, at the rate of [redacted] per year. The 25X1 committment by each agency will remain at the same level as in

phase II.

Phase IV

Phase IV will be accomplished in FY75 and will consist of:

1. Further continuation of the tasks in phase III.
2. Design of test and evaluation plans and procedures for testing and evaluation of this facility, similar to the evaluation of Project PACER.
3. Conducting a three month test and evaluation of this facility and writing a final report.

25X1 ARPA will provide [redacted] for the tasks list in phase IV. The committment by each participating agency will remain at the same level as specified in phase II and III.

V. ARPA Funding

25X1

[redacted]

21 July 1970

WORK STATEMENT

1. GENERAL:

a. The contractor is expected to develop a concept of operations and an implementation plan and schedule for a distributed experimental network of computers in the intelligence community for solving a variety of problems of common concern. The plan is to be based on the assumptions that:

(1) The initial network will consist of at least three nodes, CIA DIA and NSA with provision for expansion to include other agencies (e.g. FTD, NPIC, etc).

(2) Common hardware and software will be available at each node in the network.

(3) Each participating organization will provide qualified personnel to operate their system and to engage in problem solving activities.

b. In addition this plan will take into account the current planning of the COINS Project Management Office.

2. CONCEPTS:

a. A user operating from a remote terminal in one agency should be able to work directly, in a secure fashion with either his own system or any one of the other participating systems in the network.

b. A user operating from a remote terminal should be able to operate in either an interactive or remote batch mode depending upon his desires. For example a user should have the following kinds of capabilities:

(1) To interrogate and retrieve information from files in any participating system.

(2) To remotely update or maintain files in any participating system and also a capability to submit batch updates.

(3) To use preprogrammed routines in any system.

(4) To remotely write and debug programs in two or more higher level languages (e.g. FORTRAN IV and COBOL) on any one of the systems and to store these programs for future use.

(5) To write and edit upper and lower case textual material (NOTE: Could be useful in writing inter-agency reports using a conference call technique).

(6) To share graphics

(7) To specify output to be delivered to one or more remote devices.

3. SPECIFIC TASK:

(a) (60%) Describes the type of data processing activities, data sources, data files and processes for three broad substantive intelligence areas of common concern to the participating agencies. The three substantive intelligence areas will be identified by the COINS project Manager in consultation with the Subsystem Managers. For each of these areas the contractor will:

(1) Describe current operations throughout the community inter-organizational relationships, problems and costs associated with the current effort.

(2) Project improvements and payoffs to be derived by the community if the network is used in support of the effort.

(a) (20%) Prepare a concept of operations without specifying specific hardware except in generic terms. Idetify applications and describing capabilities to be available in the network.

(b) (20%) Prepare a general implementation plan and schedule:

(1) Identify and describe in detail the major tasks to be performed in each fiscal year starting in FY-71 thru FY-75. The following estimates will be provided for each task.

(a) Beginning and completion date

(b) Number man months of effort required by specialty (e.g. communications engineer, computer engineer, systems analyst, junior programmer, senior programmer, etc.)

(c) Dollar costs

(2) Prepare an implementation schedule integrating the tasks showing relationships between tasks according to time.

(a) Pert Chart

(b) Milestone Chart

(3) Prepare a detail break down of costs (a) manpower by specialty and (b) dollars both which should be related to time and tasks.

4. INFORMATION TO BE PROVIDED BY THE GOVERNMENT

(a) The COINS Project Manager will make available:

(1) The general plan of events,

(2) Results of studies to date

(3) Design specifications for future systems that have been tentively identified.

b. The COINS Project Manager in consultation with the Subsystem Managers will identify the three substantive intelligence areas to be considered by the contractors.

c. The participating agencies will make available the informati required by the contractors on the three substantive intelligence areas (e.g. briefing, discussions, reports cost of effort, etc).

d. The COINS Project Management Office will provide management and direction of this effort.

5. ITEMS TO BE DELIVERED BY CONTRACTOR

1. By 30 September 1970 the contractor will deliver a concept of operations and an implementation plan and schedule containing at a minim the items specified above.

2. In addition, he should be prepared to deliver several oral briefings.

SUBJECT: Concept of Operations and Implementation Plan and Schedule

OBJECTIVE: To provide the contractor [redacted]) with sufficient 25X1
information on three substantive intelligence areas during the next two months (i.e. August and September) to enable them to develop a realistic concept of operations with a related implementation plan and schedule. The three areas selected should be ones which could have a potentiality high-pay off if a cooperative network of computers were employed.

Substantive Intelligence Areas: The three substantive intelligence area to be examined are:

1. Sino-Soviet Strategic Weapon Systems (Offensive and Defensive)

2.

3.

25X1 Security Clearances: [redacted] will be the contractor for this study and they have personnel who have SI and/or TK clearances.

Access and Information Required: Contractors will require information from CIA, DIA and NSA for each major activity related to the three substantive intelligence areas being examined. For each of these activities they will require following information:

1. Mission and Objectives

2. Discription of Operation

3. Flow of Input Information

   a. Sources
   b. Media
   c. Volume
   d. Frequency
   e. Processes (manual and machine)
   f. Reports and Files received and produced

4. Support Files

   a. Manual and Machine Files
   b. Formatted and Unformatted machine files
   c. Micro-imagery Files
   d. Photographs

5. ADP Support

   a. Remote vs Off-Line batch processing
   b. Computational
   c. Information Retrieval

25X1

6. Communications Support

[redacted]

7. Gross Annual Cost of Effort

a. Manpower
b. Dollar